REMARKS

This amendment is responsive to the official action dated October 3, 2003.

Claim 60 is currently pending.

No claims are allowed.

Rejections under 35 USC §112, second paragraph:

Claim 60 was rejected under 35 USC §112, second paragraph as being indefinite. The Examiner is unclear as to the term of "encapsulate" and the intended meaning. "It is unclear whether the encapsulating medium actually surrounds and contacts the optoelectronic device or the encapsulating medium only provides a shell or casing around the optoelectronic device."

The applicant has amended claim 60 to change the term "encapsulate" to "embed" which seems to better define the intended meaning in light of the disclosure. The encapsulating medium does in fact actually surround and contact the optoelectronic device. A Webster's dictionary definition of "embed" is attached and identifies "embed" as meaning "to fix firmly in a surrounding mass".

Reconsideration and withdrawal of the rejection is respectfully solicited.

Rejection of Claim 60 Under 35 U.S.C. §103(a)

The Official Action states that claim 60 is rejected under 35 U.S.C.§103(a) as being unpatentable over DeAndrea et al., U.S. Patent 5,515,468 ("DeAndrea") in view of Leas U.S. Patent No. 4,901,329("Leas").

It is submitted that the present invention, as currently recited in amended claims 60, is not prima facie obvious over the combination of DeAndrea and Leas for the reasons discussed below.

The Examiner's basis for the rejection is restated below with the Applicant's comments inserted where appropriate.

"DeAndrea et al. discloses an optical device package (See Figures 12, 13, 14) comprising a substrate (See for example bottom surface of 30 attached to 17 in Figure

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14) having a mounting surface (See for example 17 in Figure 14); an optoelectronic device (See for example 10 in Figure 14) having a lower mounting surface operably coupled to the mounting surface of the substrate wherein the optoelectronic device is in electrical communication with the substrate (See for example connection wire from 30 to 16 in Figure 14); the optoelectronic device further having an active upper surface disposed substantially parallel to the mounting surface of the substrate (See for example 17 and 30 in Figure 14) and being configured to emit or receive light normal to the active upper surface (See for example 30 in Figure 14); a fiber coupling assembly having a body portion that is integrally molded with and substantially encapsulates (The Examiner notes that the tenth edition the Merriam-Webster's Collegiate Dictionary defines 'encapsulate' as 'to enclose in or as if in a capsule'.) the optoelectronic device (See 40/70 in Figure 14);

As indicated above, the Applicant has amended claim 60 to change the term "encapsulate" to "embed" which is believed to more accurately reflect the intended scope of the claim. In the case of DeAndrea, the fiber coupling assembly is a molded part, but it is not molded "integrally" with the optoelectronic device. The molded part 40/70 in DeAndrea is molded separately from the optoelectronic device. The optoelectronic device in DeAndrea is mounted onto a circuit board 15 and the circuit board 15 is then inserted into a cavity in the bottom of the molded part 40/70. The circuit board and the housing 40/70 are clearly separate parts as shown in the drawings. The amended term "embed" is intended to reflect that the "fiber coupling assembly" is integrally molded over the optoelectronic device and that the optoelectronic device is embedded within the fiber coupling assembly.

the fiber coupling assembly further having a barrel portion extending from the body portion in a direction substantially parallel to the substrate, the barrel portion being configured to operably engage a fiber optic cable (See Figures 11 and 14; col. 3, lines 4959; col. 10, lines 35-44);

DeAndrea discloses a housing assembly (molded part 40/70) that includes a barrel portion for accepting a fiber. The present invention claims that the fiber coupling assembly is

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integrally molded with the optoelectronic device (embedding the optoelectronic device within the fiber coupling assembly) and that it includes a barrel portion.

the fiber coupling assembly further having a planar mirror encapsulated within the body portion of the fiber coupling assembly to reflect light traveling within the body portion (See for example 3 10 in Figure 14); and

As indicated above, claim 60 has been amended to recite that the mirror is embedded within the fiber coupling assembly, meaning that the mirror is firmly fixed within the surrounding mass. DeAndrea discloses a mirror structure that is simply disposed within the outer housing structure.

an enclosure coupled to the substrate that houses the optoelectronic device (See for example 55 and 52 in Figure 14).

The Examiner has identified elements 55 and 52 in DeAndrea as disclosing an enclosure. However, elements 52 and 55 point to the same general structure as 40/70 which the Examiner identified as the fiber coupling assembly. Applicant has recited the enclosure as a separate element in the claim because it is a separate structural element from the fiber coupling assembly.

DeAndrea et al. lacks the fiber coupling assembly being optically transparent. the body portion of the fiber coupling assembly being configured and arranged to transmit light. However, Leas teaches an integrated laser array (See for example Figures 1, 4, and 6), wherein a transparent encapsulating medium (See 32 in Figure 6; col. 3, line 57-col. 4, line 49) is used to surround all the components (i.e. for example the laser 20 and planar routing mirrors 28' and 28" in Figure 6) while allowing the light emitted from the laser to be transmitted within the transparent encapsulating medium. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the fiber coupling assembly

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be optically transparent, the body portion of the fiber coupling assembly being configured and arranged to transmit light, as taught by Leas, in the optical device package of DeAndrea et al., for the purpose of reducing scattering and Fresnel losses within the device, while providing protection for the components embedded within the encapsulating material from damage.

The Applicant disagrees with the Examiner's determination of obviousness. In order to combine references for a teaching of obviousness, one of the references must suggest or teach that the combination is beneficial or desirable. The simple statement that Leas can be combined with DeAndrea to reduce scattering and Fresnel losses ignores the complex nature of transmitting light through coupling mediums. It is important to note that typical potting materials for protection are not selected for their optical transmissive qualities because the emitting device and the light path are usually set and stabilized prior to potting. This was the case with Albaugh as previously cited. Albaugh used a fiber within the package to bring the light from the device to the outside. The potting material surrounded the fiber and was not intended to be optically transmissive to transmit light. Potting of an optical device must take into consideration that the characteristics of the emitted light change when transmitted through a coupling medium. DeAndrea discloses an optoelectronic device that transmits through air within the housing and then is refocused through a lens/mirror structure. There is no teaching or suggestion to entirely embed the optoelectronic device in an optically transparent material which would also be molded to form the fiber coupling portion. Potting for protection alone would not teach that the material should be optically transmissive, nor would it teach to form the fiber coupling as part of the housing.

The Examiner has cited that Leas fills the gaps in DeAndrea by showing an optically transmissive potting material having the laser and mirror structures within the potting material. However, as indicated above, it is submitted that there is no motivation in DeAndrea for the combination. Even if the Examiner can show a general presumption that potting alone is a sufficient motivating factor for the combination, such a combination would only teach that the interior space in the housing of DeAndrea should be filled with an optically transparent potting material. As indicated above, this blanket assumption ignores the complex change in

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the characteristics of the light emitted from the optoelectronic device that may occur if the enclosure is simply filled with a protective (optically transmissive) material. Behavior and performance of the device are sure to be affected by the arrangement. The present invention provides a unique mechanical and optical arrangement for propagating the light from the device to the end surface of the fiber with only 2 material transitions device to encapsulant and encapsulant to air. In the present invention, the first transition from the device itself to the encapsulation material is known in advance and is accommodated in the production of the device. This is a critical distinction and needs to be given weight in the context of a motivating or non-motivating factor for the combination with Leas. Potting for protection is done without consideration to performance or optical transmission because the light is not intended to travel through a protective potting material. Leas does disclose that the laser and mirrors are within an optically transmissive material, but application of the teachings of Leas to DeAndrea cannot be implemented without consideration of the affect on the output of the laser device itself.

Furthermore, neither DeAndrea nor Leas discloses that the potting (encapsulation) material itself be used to form the fiber coupling assembly. Leas discloses that the encapsulating material is TiO^2 which is a high index material that is deposited by chemical vapor deposition. It would not be possible to integrally mold the barrel portion of the present device from such a material. Integrally forming the fiber coupling assembly to have a body which sits over the device and a barrel for receiving the end of the fiber provides for superior alignment of the device with the fiber and is believed to reduce manufacturing and alignment issues during production. There is clearly a benefit to integrally molded the body and fiber receiving barrel from the same material.

Thus, even if a person of ordinary skill in the art combined the teachings of DeAndrea and Leas, they would not arrive at the present invention. In view of the foregoing, it is respectfully requested that the rejection of claim 60 under 35 U.S.C.§103(a) be withdrawn.

In summary, Applicants submit that the claim presented for consideration herein is patentable and each of the Examiner's rejections and objections has been overcome.

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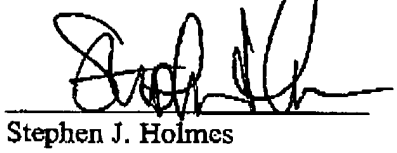
Accordingly, Applicants respectfully request favorable reconsideration and allowance of claim 60 (as amended).

The Commissioner is hereby authorized to charge any additional required fee in connection with the filing of this paper or credit any overpayment to Deposit Account 02-0900.

Should there be any outstanding matter that needs to be resolved in the present application, the Examiner is respectfully requested to contact the undersigned at the telephone number listed below.

Respectfully submitted,



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em·bed Pronunciation Key (ĕm-bĕd ') also **im·bed** (ĭm-)
v. **em·bed·ded, em·bed·ding, em·beds**
v. tr.

1. To fix firmly in a surrounding mass: *embed a post in concrete; fossils embedded in shale.*
2. To enclose snugly or firmly.
3. To cause to be an integral part of a surrounding whole: "a minor accuracy embedded in a larger untruth" (Ian Jack).
4. *Biology.* To enclose (a specimen) in a supporting material before sectioning for microscopic examination.

v. intr.

To become embedded: *The harpoon struck but did not embed.*

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embed

\Em*bed"\, v. t. [imp. & p. p. Embedded; p. pr. & vb. n. Embedding.] [Pref. em- + bed. Cf. Imbed.] To lay as in a bed; to lay in surrounding matter; to bed; as, to embed a thing in clay, mortar, or sand.

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embed

v : to fix or set securely or deeply: "Kneeling, Cobb planted a sturdy knee in the small of his back," [syn: implant, engraft, imbed, plant]

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embed

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